WTCI-716-P

Cheri Sawyer

From: Bhol, Saroj [sbhol@panynj.gov]
Sent: Tuesday, March 15, 2005 3:28 PM
To: Shyam Sunder
Cc: jason.averill@nist.gov; cauffman@nist.gov; cheri.sawyer@nist.gov; Begley, James; Fadavi, Ali; Hurley, Michael; Lin, C. John; Lombardi, Frank; Reiss, Alan; Zipf, Peter
Subject: RE: Request for information

Shyam,

Here's the information Jason requested:

There is no record regarding the consideration of a fourth stairwell from floors 106 and 107 in WTC 1. As concurred by the NYC Department of Buildings and documented in the Fasullo to Visconti letter dated January 27, 1995 (see attachment), code required exits were provided by the use of areas of refuge in accordance with the New York City Building Code (1968 and current) Section 27-367.

For controlling the number of occupants on the observation level in WTC 2, there were turnstiles on the mezzanine before the entrance to the elevators that were used to count the number of people going up, but since the patrons exited via a different route & location, there was no way to count the number of people leaving - and thereby calculate the number actually on the deck. Since the turnstiles were not very effective, their use was discontinued later and the number of ticket sales was used for controlling the number of occupants. The length of the line waiting for the elevators to take people down were constantly observed by staff. If the crowds grew too large, ticket sales were halted until the crowd size was reduced.

Thanks

Saroj

-----Original Message-----
From: Shyam Sunder [mailto:sunder@nist.gov]
Sent: Monday, March 14, 2005 9:28 AM
To: Bhol, Saroj
Cc: jason.averill@nist.gov; cauffman@nist.gov; cheri.sawyer@nist.gov
Subject: Fwd: Request for information

Saroj,

Could you please respond to the following inquiry? Thanks.

Shyam

X-Sieve: CMU Sieve 2.2
From: "Jason Averill" <jason.averill@nist.gov>
To: "'Shyam Sunder'" <sunder@nist.gov>
Subject: Request for information
Date: Mon, 14 Mar 2005 09:11:29 -0500
X-Mailer: Microsoft Office Outlook, Build 11.0.6353
Thread-Index: AcUon7cwK20ocYOpRXm8KMfnScZGmQ==

X-NIST-MailScanner: Found to be clean
X-MailScanner-From: jason.averill@nist.gov

Shyam,

Can you ask the PA if they have any information regarding consideration of a fourth stairwell serving Floors 106 and 107 in WTC 1 (as required by 1968 and current NYCBC), which according to the Fasullo to Visconti memo dated January 27, 1995, had occupant loads exceeding one-thousand on each floor?

Additionally, please ask whether the PA controlled the number of occupants on the observation level of WTC 2 at any time and what the occupant load may have been.

Thank you,

Jason

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Dr. S. Shyam Sunder
Acting Deputy Director
Building and Fire Research Laboratory
National Institute of Standards and Technology
Gaithersburg, MD 20899-8600
Tel.: 301-975-6850; Fax: 301-975-4032
==========

1

1/27/95

THE PORT AUTHORITY OF NY & NJ

One World Trade Center
New York N.Y. 10048

Engineering Department
Eugene J. Fasullo, P.E.
Director of Engineering &
Chief Engineer

(212) 435-7449
201) 961-6600 x7449

January 27, 1995

Mr. Richard C. Visconti, R.A.
First Deputy Commissioner
New York City Department of Buildings
60 Hudson Street
New York, New York 10013

Dear Commissioner Visconti:

Thank you for the time you spent with Port Authority (PA) staff on December 6, 1994 to discuss the proposed design plan (the "design plan") for the Windows on the World Restaurant located on the 106th and 107th floors of the World Trade Center. We discussed with you:

- The PA's proposal to divide the entire floor, on each of the two Restaurant floors, into three (3) areas of refuge in accordance with Section 27-372 of the Administrative Code that will provide additional vertical exit capacity to the existing stairs in accordance with the exit reduction allowances of Section 27-367 of the Code;

- Each area of refuge is separated by a two hour fire rated separation;

- In one (1) area on each of the Restaurant's floors, the capacity of the stair within the area is less than one third of the proposed occupant load of that area.

Following this discussion, you and Mr. Trivisonno, also of the Department of Buildings, stated that the proposed design is acceptable and conforms to the New York City Building Code due to the fact that on each floor each area of refuge has access to its "own" exit stair within the area, to the other two (2) areas of refuge, and additionally to an elevator, and our calculations of the egress facilities demonstrate that the code allowed capacity of all three stairs is sufficient to permit safe egress for the occupant load from each area and from the entire floor. You further indicated that the exit doors should swing properly in the direction of egress.

Attached are reduced versions of the two plans entitled "106th Floor Egress Plan" and "107th Floor Egress Plan" used for this discussion.

If you find the above to be a fair and accurate summary of the meeting, I would appreciate your concurrence.

Very truly yours,

Eugene J. Fasullo, P.E.
Director of Engineering &
Chief Engineer

CONCURRED:

Richard Visconti

Richard C. Visconti, First Deputy Commissioner
New York City Department of Buildings

Att.

bcc: S. Bhol' N. Chanfrau P. Cooper.

716-P

Cheri Sawyer

From: Bhol, Saroj [sbhol@panynj.gov]
Sent: Wednesday, March 23, 2005 2:26 PM
To: Shyam Sunder
Cc: jason.averill@nist.gov; rbukowski@nist.gov; cauffman@nist.gov; cheri.sawyer@nist.gov; Begley, James; Fadavi, Ali; Lin, C. John; Lombardi, Frank; Reiss, Alan; Zipf, Peter
Subject: RE: WTC 2 Observation Deck Load

Shyam,

Here's the clarification requested:

As indicated in note 1 on the Plan, the maximum occupant load permitted on the floor was 1170 and it was enforced by the lessee of the space - Top of the World - with periodic oversight by the World Trade Department. The enforcement was through constant observation by staff and controlling ticket sales, as explained in my 3/15/05 response.

New York City Building Code Section 27-358(b)(1) permits a lower basis for occupant load. The discrepancy in the total of numbers on the plan was an oversight.

Thanks

Saroj

Saroj -----Original Message-----
From: Shyam Sunder [mailto:sunder@nist.gov]
Sent: Tuesday, March 22, 2005 12:03 PM
To: Bhol, Saroj
Cc: jason.averill@nist.gov; rbukowski@nist.gov; cauffman@nist.gov; cheri.sawyer@nist.gov
Subject: Fwd: WTC 2 Observation Deck Load

Saroj,

Could you please provide the clarification requested below in response to your email regarding the WTC 2 Observation Deck? Thanks.

Shyam

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X-Sieve: CMU Sieve 2.2
From: "Jason Averill" <jason.averill@nist.gov>
To: "'Shyam Sunder'" <sunder@nist.gov>
Subject: WTC 2 Observation Deck Load
Date: Tue, 22 Mar 2005 09:48:47 -0500
X-Mailer: Microsoft Office Outlook, Build 11.0.6353
Thread-Index: AcUu7kCRGS9mfuCZT8qJaEoXIuB1/Q==
X-NIST-MailScanner: Found to be clean
X-MailScanner-From: jason.averill@nist.gov

Shyam,

Please ask the Port Authority to clarify the point raised in the previous communication:

On the February 1, 1996 Top of the World Plan Submitted by Ogden Entertainment, the following occupant load was calculated using NYCBC:

#1 - Western Area of Refuge:
(Occupancy Class F3) 647 persons
+ (Occupancy Class F4) 180 + 72 persons
+ (Occupancy Class C) 27 persons
+ (Occupancy Class B2) 3 persons
+ (Occupancy Class D2) 6 persons
---
935 persons

#2 - Southeastern Area of Refuge
(Occupancy Class F3) 281 persons
+ (Occupancy Class B2) 3 persons
+ (Occupancy Class E) 1 person
+ (Occupancy Class C) 32 + 26 persons
---
343 persons

#3 -
(Occupancy Class F3) 339 + 134 persons
+ (Occupancy Class B2) 1 person
+ (Occupancy Class D2) 0 person
---
473 persons

Total of all three areas of refuge: 935 + 343 + 473 = 1,751 persons

Total capacity of stairs: 3 * 6.5 Units of Exit Width = 1,170 persons

NYCBC [C26-601.2] 27-358 - The number of occupants for whom exit facilities shall be provided shall be established either (1) by the actual number of occupants for whom each occupied space, floor, or building, as the case may be, is designed, or (2) by using the appropriate occupant-area ratios from table 6-2, whichever is larger.

The occupant load calculated using the area ratios was larger than the stair capacity.

What is the position of the Port Authority regarding this discrepancy?

Thank you,

Jason

==========
Dr. S. Shyam Sunder
Acting Deputy Director
Building and Fire Research Laboratory
National Institute of Standards and Technology
Gaithersburg, MD 20899-8600
Tel.: 301-975-6850; Fax: 301-975-4032
==========

716-P

Cheri Sawyer

From: Shyam Sunder [sunder@nist.gov]
Sent: Friday, March 25, 2005 10:29 AM
To: Bhol, Saroj; Richard Bukowski
Cc: jason.averill@nist.gov; rbukowski@nist.gov; cauffman@nist.gov; cheri.sawyer@nist.gov; Begley, James; Fadavi, Ali; Lin, C. John; Lombardi, Frank; Reiss, Alan
Subject: RE: Question for PA

Saroj,

Thank you for your response. We appreciate your concern but the issue is relevant to one of the four investigation objectives, viz., to determine the procedures and practices that were used in the design, construction, operation, and maintenance of the WTC buildings. The specific investigation report will document what the code requirements were and provide a statement as to the relevance of the issue to the outcome on 9/11.

Shyam

At 10:21 AM 3/25/2005, Bhol, Saroj wrote:

> The dates are accurate. The Port Authority, however, feels the statement, particularly the first sentence, is unnecessary and not relavent to the Investigation of World Trade Center Collapse on September 11, 2001. The statement will only encourage questions from people who are not familiar with the code. After 1993 bombing, the restaurant was completely redesigned and the exit facilities were reviewed for the new occupant load. It was not the implementation of an agreed upon solution, as suggested in the statement. The plans for the original Windows on the World are not available but the design complied with code that was effective then.
>
> Thanks
>
> Saroj
> -----Original Message-----
> **From:** Richard Bukowski [mailto:bukowski@nist.gov]
> **Sent:** Wednesday, March 23, 2005 8:55 AM
> **To:** Bhol, Saroj; 'Shyam Sunder'
> **Cc:** jason.averill@nist.gov; rbukowski@nist.gov; cauffman@nist.gov; cheri.sawyer@nist.gov; Begley, James; Fadavi, Ali; Lin, C. John; Lombardi, Frank; Reiss, Alan
> **Subject:** RE: Question for PA
>
> Saroj,
>
> We would appreciate it if you could confirm the accuracy of the dates in following statement, which refers to the January 27, 1995 letter from Fasullo to Visconti detailing the agreed arrangement of the 106th and 107th floors into 3 areas of refuge:
>
> "Since Windows on the World first opened in April 1976, it is unclear what conditions existed from that date to the time the agreed solution was implemented in 1995. ... The Windows on the World

facilities were closed following the bombing and reopened in 1996 after a complete refurbishment that included the egress system changes."

RWB

From: Bhol, Saroj [mailto:sbhol@panynj.gov]
Sent: Monday, March 21, 2005 1:35 PM
To: Shyam Sunder
Cc: jason.averill@nist.gov; rbukowski@nist.gov; cauffman@nist.gov; cheri.sawyer@nist.gov; Begley, James; Fadavi, Ali; Lin, C. John; Lombardi, Frank; Reiss, Alan
Subject: RE: Question for PA

Shyam,

Here's the response to Jason's inquiry:

1. The Tenant Alteration Application from Ogden Entertainment was approved by the Port Authority. The approved drawing A2 (drawing date 1/5/96, PA stamp date Jan 18, 1996) indicates the occupant load of 1170, which was based on 3 stairs with total 6.5 exit units and 2 areas of refuge in compliance with NYC Building Code sections 27-359 and 27-367.

2. 44 inches and 56 inches refer to the minimum widths for 2 and 2.5 exit units, respectively, as per NYC Building Code. Original Emery Roth drawing A.B. 172 for 107th floor shows the actual stair widths as 3'- 9 1/2" and 4'- 9 1/2", which are more than the minimum required for the number of exit units. The exit units of 2 and 2.5 in the Ogden's tenant alteration drawing is accurate although the indicated stair widths of 48" and 60" may not be accurate.

Thanks

Saroj

-----Original Message-----
From: Shyam Sunder [mailto:sunder@nist.gov]
Sent: Wednesday, March 16, 2005 2:28 PM

To: Bhol, Saroj
Cc: jason.averill@nist.gov; rbukowski@nist.gov; cauffman@nist.gov; cheri.sawyer@nist.gov
Subject: Fwd: Question for PA

Saroj,

Could you please respond to this inquiry? Thanks.

Shyam

==========

X-Sieve: CMU Sieve 2.2
From: "Jason Averill" <jason.averill@nist.gov>
To: "'Shyam Sunder'" <sunder@nist.gov>
Subject: Question for PA
Date: Wed, 16 Mar 2005 14:22:02 -0500
X-Mailer: Microsoft Office Outlook, Build 11.0.6353
Thread-Index: AcUqXW5xqkIWG0fmRXqUGaBbN8SQxg==
X-NIST-MailScanner: Found to be clean
X-MailScanner-From: jason.averill@nist.gov

Shyam,

We have two more questions regarding egress and the observation deck in WTC 2, specifically regarding the tenant alteration application from Ogden Entertainment in late 1995 and early 1996:

1. The design occupant load for floor 107 (drawing dated January 18, 1996) calculates 1,751 occupants using the NYCBC use group F. Was this application approved by the Port Authority as the occupant load for floor 107? If not, what was the design occupant load for WTC 2, floor 107?
2. The same drawing indicates three stairwells, two listed as 48 inches wide and one listed as 60 inches wide. These measurements are inconsistent with NIST's understanding that Stairwell A and Stairwell C were 44 inches wide, while Stairwell B was 56 inches wide at all floors in both WTC 1 and WTC 2. Please clarify which measurements are correct.

The work order referenced for this tenant application was W96-2103, if this helps locate the documents.

Thank you,

Jason

==========

Dr. S. Shyam Sunder
Acting Deputy Director
Building and Fire Research Laboratory
National Institute of Standards and Technology
Gaithersburg, MD 20899-8600
Tel.: 301-975-6850; Fax: 301-975-4032

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Dr. S. Shyam Sunder
Acting Deputy Director
Building and Fire Research Laboratory
National Institute of Standards and Technology
Gaithersburg, MD 20899-8600
Tel.: 301-975-6850; Fax: 301-975-4032

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716-P

Cheri Sawyer

From: Bhol, Saroj [sbhol@panynj.gov]
Sent: Friday, May 06, 2005 9:02 AM
To: sunder@nist.gov
Cc: rbukowski@nist.gov; jason.averill@nist.gov; james.lawson@nist.gov; cauffman@nist.gov; cheri.Sawyer@nist.gov; Begley, James; Fadavi, Ali; Lin, C. John; Lombardi, Frank; Reiss, Alan
Subject: Exits for Assembly Use Spaces

Shyam,
Here's the response to the questions in the attachment.
Thanks
Saroj

(The numbers relate to the questions)

1. PA reaches out to the NYC Department of Buildings (DOB) for code clarifications and interpretations. Based on PA's meeting on exits from the Windows on the World with the DOB on December 6, 1994, it's PA's understanding that "20% of the floor area" in section 27-367 is intended to be the total floor area in the building occupied by the principal use.

2. There are no other section in the code on exit reduction beside section 27-367.

3. During the meeting with the DOB, the need for a fourth stair did not arise.

-----Original Message-----
From: Shyam Sunder [mailto:sunder@nist.gov]
Sent: Monday, May 02, 2005 1:19 PM
To: Bhol, Saroj
Cc: rbukowski@nist.gov; jason.averill@nist.gov; james.lawson@nist.gov; cauffman@nist.gov; cheri.Sawyer@nist.gov
Subject: Exits for Assembly Use Spaces

Saroj,

Attached is a request for information/clarification regarding the numbers of exist required for the assembly use spaces at the top of the WTC towers. Please be advised that NIST has not made a determination whether the WTC towers required four stairwells as a result of these spaces. We would appreciate your response in the near future.

Shyam

Dr. S. Shyam Sunder
Acting Deputy Director
Building and Fire Research Laboratory
National Institute of Standards and Technology
Gaithersburg, MD 20899-8600
Tel.: 301-975-6850; Fax: 301-975-4032

Number of Exits Required in the Assembly Use Areas of the WTC Towers
All of the building codes examined in this study contain nearly identical requirements for Means of Egress, so this discussion will focus on the (1968) New York City Building Code (NYCBC). The building code (27-366) requires that every floor shall have "... *at least two independent exits, remote from each other ...*" except for one and two family dwellings and certain group J (multifamily residential) buildings. Subparagraph 3 of this section states further that,

"Notwithstanding any other provision of this section, when, within a building, any place of assembly has an occupant load between five hundred and nine hundred ninety-nine persons, there shall be provided at least three independent exits, remote from each other, from each floor; ***any such place of assembly with an occupant load of one thousand or more persons shall be provided with at least four independent exits, remote from each other, from each floor*** *(emphasis added)."*

However the next section provides for reductions in the number of exits required as follows:

*"**27-367 Exit reduction** - When a floor area has access to areas of refuge that comply with the requirements of section 27-372 of article five of this subchapter, the number of persons for whom vertical exits are to be provided may be reduced to fifty percent of the occupant load of the floor area when one area of refuge is provided, and may be reduced to thirty-three percent of the floor area when two areas of refuge are provided. This section shall not be applicable to any new or altered place of assembly, except for such places of assembly in fully sprinklered office buildings* ***which occupy less than twenty percent of the floor area occupied by the principal use*** *(emphasis added)."*

For the office floors the occupant load was no more than 390 and only two exits (providing a minimum of 6 ½ units of exit width, total) were required. Three exits providing a total of 6 ½ units of exit width were present.

For Windows on the World (floors 106 and 107 in WTC 1), however, the occupant loads were 1,013 and 1,130 respectively and the capacity of the stairs was increased to 1,170 by the creation of three areas of refuge, arranged in accordance with the requirements of section 27-372. Similarly for Top of the World (floor 107 in WTC 2) the occupant load calculated by the code required method was 1,751, but was limited to the 1,170 stair capacity (permitted by the creation of three areas of refuge) by order of The Port Authority and enforced by the tenant.

Applying the NYCBC provisions to Windows on the World and Top of the World:

- 27-366 (3) calls for four independent exits, except as modified by the next section.
- 27-367 does not appear to be applicable since all three floors were altered places of assembly (they had been renovated after the 1993 bombing) and:
    - The buildings do not appear to have been fully sprinklered in 1995.

- It appears the buildings were fully sprinklered by September 11, 2001 (as late as 1999 the sprinkler system being installed on the skylobby floors). However, the places of assembly occupied more than twenty percent of the floor area occupied by the principal use on those floors (which was assembly use).

Questions for the Port Authority of New York and New Jersey:

1. How does the PANYNJ interpret above sections 27-366 and 27-367 of the New York City Building Code?

2. Are there other sections of the New York City Building Code that would have allowed a different interpretation regarding the number of exits required?

3. On what basis does the PANYNJ conclude that a fourth exit was not required?

Keep w/ 716-P

Cheri Sawyer

From: Shyam Sunder [sunder@nist.gov]
Sent: Monday, June 13, 2005 6:19 PM
To: Fatma Amer; Stephen Kramer; Stephanie Reid; Sheila Bellamy
Cc: Patricia J. Lancaster; rbukowski@nist.gov; jason.averill@nist.gov; james.lawson@nist.gov; cauffman@nist.gov; cheri.Sawyer@nist.gov
Subject: RE: Exits_for_Assembly_Use_Spaces_DoB_050605.doc

Fatma,

As always, your answers are thorough and clear. We very much appreciate your response.

Best regards,

Shyam

==========

At 06:11 PM 6/13/2005, Fatma Amer wrote:
>Hi Shyam,
>If you look at my previous email, I specifically said that use of exit
>reduction is prohibited with PA's. It means, areas of refuge and
>horizontal exits are not to be credited for required means of egress.
>Therefore, the answers to your questions will be:
>
>1- If you divide the floor with rated walls, each area will be
>considered an independent PA space that needs its own access to two
>means of egress without going through another PA space if they have
>less than 500 occupant load each. However, the floor shall have the
>min. of four independent means of egress (stairs) to street.
>
>2- Since the exit reduction is not an option, and since one PA space
>should not exit to another PA space, the horizontal exits shall not be
>credited unless the spaces are used non-simultaneously.
>
>3- Yes, and the travel distance from the roof deck along the
>connecting stairs to the required means of egress at the observation
>floor shall be within max. permitted by the code.
>
>I hope I was able to answer your questions clearly.
>
>-----Original Message-----
>From: Shyam Sunder [mailto:sunder@nist.gov]
>Sent: Monday, June 13, 2005 11:33 AM
>To: Fatma Amer; Stephen Kramer; Stephanie Reid; Sheila Bellamy
>Cc: Patricia J. Lancaster; rbukowski@nist.gov; jason.averill@nist.gov;
>james.lawson@nist.gov; cauffman@nist.gov; cheri.Sawyer@nist.gov
>Subject: RE: Exits_for_Assembly_Use_Spaces_DoB_050605.doc
>
>If at all possible, we'd appreciate your early response to help clarify
>these follow up questions . Thanks very much.
>
>Shyam
>
>==========
>
>We have a few additional follow up questions for which we'd appreciate
>your clarification of the NYC Building Code provisions.
>
>Let us say that a roof top restaurant or observation floor, open to the
>general public and tourists, had an occupancy load greater than 1,000.
>This would have required 4 exits per the NYC Building Code. Let us
>also say that the floor was divided into three areas of refuge

>completely enclosed by 2-hour construction and each with direct access
>to one stairway and at least one elevator. Let us further say that
>each area of refuge has an occupant load of less than 500.
>
>1. Are the number of exits required dependent on the occupant load for
>the entire floor (4 exits for over 1,000 occupants) or for each area of
>refuge individually (2 exits per area of refuge with less than 500
>occupants)?
>
>2. Are the doors (horizontal exits) leading into the two other areas
>of refuge considered "independent exits from the floor" such that each
>area of refuge had three exits (two doors to other areas of refuge and
>the one
>stairway) which was one more than required? Or, would four stairways
>be required from the floor?
>
>3. Should the occupant load of a roof-top deck above the observation
>floor be added to the occupant load of the observation floor if the
>only means of egress from that deck was through the space on the
>observation floor?
>
>Best regards,
>
>Shyam
>
>==========
>
>
>At 01:15 PM 5/6/2005, Fatma Amer wrote:
> >The idea behind the 20% allowance is the fact that the PA space is
> >used
>
> >by the same tenant employees who are very familiar with the building
> >and regularly participate in the fire drills. If we are talking
> >about a roof top restaurant or an observation deck that is opened for
> >the general public and tourists, the concept of exit reduction shall
> >not be
>
> >allowed.
> >
> >-----Original Message-----
> >From: Shyam Sunder [mailto:sunder@nist.gov]
> >Sent: Friday, May 06, 2005 1:08 PM
> >To: Fatma Amer; Stephen Kramer; Stephanie Reid; Sheila Bellamy
> >Cc: Patricia J. Lancaster; rbukowski@nist.gov;
> >jason.averill@nist.gov; james.lawson@nist.gov; cauffman@nist.gov;
> >cheri.Sawyer@nist.gov
> >Subject: RE: Exits_for_Assembly_Use_Spaces_DoB_050605.doc
> >
> >
> >Thank you very much for that quick and insightful response. I assume
> >that in your example 50,000 sq.ft. is the total floor area over all 5
> >floors from the 5th to the 9th floor occupied by the single tenant.
> >
> >I have a follow up question. If a roof top restaurant or observation
> >deck (accessible to all building occupants and visitors) is operated
> >by
>
> >an independent tenant in a fully sprinklered office building with
> >multiple tenants, is "tenant space" (used in calculating the 20%
> >limit)
>
> >restricted to the space occupied by the operator of the roof top
> >facility or would it include all tenant space within the multi-tenant
> >office building?
> >
> >Shyam

> >
> >==========
> >
> >At 12:50 PM 5/6/2005, Fatma Amer wrote:
> > >1- The deciding factors and code sections that may affect number
> > >of exits on the floor : occupant load 27-358, capacity of exits
> > >27-359,
>
> > >travel distance 27-360, exits from floors 27-366, exit reduction
> > >27-367
> >
> > >and the equivalent sections in Subchapter 8 "Places of Assembly".
> > >
> > >2- In general exit reduction concept is not permitted for places
> > >of assembly except an accessory PA in fully sprinklered office
> > >buildings
>
> > >(like cafeteria, training rooms, meeting rooms etc.)limited to 20%.
> > >The dept. has interpreted this limitation to 20% of the entire
> > >floor area of the tenant space where such PA is an accessory to.
> > >
> > >Meaning, if I have 40 story office building fully sprinklered and
> > >occupied by Citigroup from the 5th to the 9th floors (50,000.00
> > >sq.ft.), and Citigroup has an employee cafeteria on the 7th floor.
> > >In order for Citigroup to enjoy exit reduction provisions of
> > >section 27-367, such cafeteria shall not occupy more than 20% of
> > >the 50,000.00
> >sq. ft., i.e..
> > >10,000.00 sq.ft.
> > >
> > >
> > >
> > >-----Original Message-----
> > >From: Shyam Sunder [mailto:sunder@nist.gov]
> > >Sent: Friday, May 06, 2005 12:18 PM
> > >To: Fatma Amer; Stephen Kramer; Stephanie Reid; Sheila Bellamy
> > >Cc: Patricia J. Lancaster; rbukowski@nist.gov;
> > >jason.averill@nist.gov; james.lawson@nist.gov; cauffman@nist.gov;
> > >cheri.Sawyer@nist.gov
> > >Subject: Fwd: Exits_for_Assembly_Use_Spaces_DoB_050605.doc
> > >
> > >
> > >As part of NIST's World Trade Center Investigation, we would
> > >appreciate responses from the NYC Department of Buildings to the
> > >attached questions. These relate to interpretation of the NYC
> > >Building
> >
> > >Code sections regarding exists for assembly use spaces.
> > >
> > >I am sending this email request to a number of you since I wasn't
> > >sure who would be the appropriate point of contact.
> > >
> > >We would appreciate an early response. Thank you.
> > >
> > >Best regards,
> > >
> > >Shyam
> > >
> >
> >==========
> >Dr. S. Shyam Sunder
> >Acting Deputy Director
> >Building and Fire Research Laboratory National Institute of Standards
> >and Technology Gaithersburg, MD 20899-8600
> >Tel.: 301-975-6850; Fax: 301-975-4032
> >==========

Dr. S. Shyam Sunder
Deputy Director
Building and Fire Research Laboratory
National Institute of Standards and Technology
Gaithersburg, MD 20899-8600
Tel.: 301-975-6850; Fax: 301-975-4032

Cheri Sawyer

From: Shyam Sunder [sunder@nist.gov]
Sent: Monday, June 13, 2005 11:33 AM
To: Fatma Amer; Stephen Kramer; Stephanie Reid; Sheila Bellamy
Cc: Patricia J. Lancaster; rbukowski@nist.gov; jason.averill@nist.gov; james.lawson@nist.gov; cauffman@nist.gov; cheri.Sawyer@nist.gov
Subject: RE: Exits_for_Assembly_Use_Spaces_DoB_050605.doc

If at all possible, we'd appreciate your early response to help clarify these follow up questions . Thanks very much.

Shyam

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We have a few additional follow up questions for which we'd appreciate your clarification of the NYC Building Code provisions.

Let us say that a roof top restaurant or observation floor, open to the general public and tourists, had an occupancy load greater than 1,000. This would have required 4 exits per the NYC Building Code. Let us also say that the floor was divided into three areas of refuge completely enclosed by 2-hour construction and each with direct access to one stairway and at least one elevator. Let us further say that each area of refuge has an occupant load of less than 500.

1. Are the number of exits required dependent on the occupant load for the entire floor (4 exits for over 1,000 occupants) or for each area of refuge individually (2 exits per area of refuge with less than 500 occupants)?

2. Are the doors (horizontal exits) leading into the two other areas of refuge considered "independent exits from the floor" such that each area of refuge had three exits (two doors to other areas of refuge and the one stairway) which was one more than required? Or, would four stairways be required from the floor?

3. Should the occupant load of a roof-top deck above the observation floor be added to the occupant load of the observation floor if the only means of egress from that deck was through the space on the observation floor?

Best regards,

Shyam

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At 01:15 PM 5/6/2005, Fatma Amer wrote:
>The idea behind the 20% allowance is the fact that the PA space is used
>by the same tenant employees who are very familiar with the building
>and regularly participate in the fire drills. If we are talking about
>a roof top restaurant or an observation deck that is opened for the
>general public and tourists, the concept of exit reduction shall not be
>allowed.
>
>-----Original Message-----
>From: Shyam Sunder [mailto:sunder@nist.gov]
>Sent: Friday, May 06, 2005 1:08 PM
>To: Fatma Amer; Stephen Kramer; Stephanie Reid; Sheila Bellamy
>Cc: Patricia J. Lancaster; rbukowski@nist.gov; jason.averill@nist.gov;
>james.lawson@nist.gov; cauffman@nist.gov; cheri.Sawyer@nist.gov
>Subject: RE: Exits_for_Assembly_Use_Spaces_DoB_050605.doc
>
>

>Thank you very much for that quick and insightful response. I assume
>that in your example 50,000 sq.ft. is the total floor area over all 5
>floors from the 5th to the 9th floor occupied by the single tenant.
>
>I have a follow up question. If a roof top restaurant or observation
>deck (accessible to all building occupants and visitors) is operated by
>an independent tenant in a fully sprinklered office building with
>multiple tenants, is "tenant space" (used in calculating the 20% limit)
>restricted to the space occupied by the operator of the roof top
>facility or would it include all tenant space within the multi-tenant
>office building?
>
>Shyam
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>
>At 12:50 PM 5/6/2005, Fatma Amer wrote:
> >1- The deciding factors and code sections that may affect number of
> >exits on the floor : occupant load 27-358, capacity of exits 27-359,
> >travel distance 27-360, exits from floors 27-366, exit reduction
> >27-367
>
> >and the equivalent sections in Subchapter 8 "Places of Assembly".
> >
> >2- In general exit reduction concept is not permitted for places of
> >assembly except an accessory PA in fully sprinklered office buildings
> >(like cafeteria, training rooms, meeting rooms etc.)limited to 20%.
> >The dept. has interpreted this limitation to 20% of the entire floor
> >area of the tenant space where such PA is an accessory to.
> >
> >Meaning, if I have 40 story office building fully sprinklered and
> >occupied by Citigroup from the 5th to the 9th floors (50,000.00
> >sq.ft.), and Citigroup has an employee cafeteria on the 7th floor.
> >In order for Citigroup to enjoy exit reduction provisions of section
> >27-367, such cafeteria shall not occupy more than 20% of the
> >50,000.00
>sq. ft., i.e..
> >10,000.00 sq.ft.
> >
> >
> >
> >-----Original Message-----
> >From: Shyam Sunder [mailto:sunder@nist.gov]
> >Sent: Friday, May 06, 2005 12:18 PM
> >To: Fatma Amer; Stephen Kramer; Stephanie Reid; Sheila Bellamy
> >Cc: Patricia J. Lancaster; rbukowski@nist.gov;
> >jason.averill@nist.gov; james.lawson@nist.gov; cauffman@nist.gov;
> >cheri.Sawyer@nist.gov
> >Subject: Fwd: Exits_for_Assembly_Use_Spaces_DoB_050605.doc
> >
> >
> >As part of NIST's World Trade Center Investigation, we would
> >appreciate responses from the NYC Department of Buildings to the
> >attached questions. These relate to interpretation of the NYC
> >Building
>
> >Code sections regarding exists for assembly use spaces.
> >
> >I am sending this email request to a number of you since I wasn't
> >sure who would be the appropriate point of contact.
> >
> >We would appreciate an early response. Thank you.
> >
> >Best regards,
> >
> >Shyam
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